Fluorinated pentacene derivatives, for example, the novel compounds tetradecafluoropentacene, 5,6,7,12,13,14-hexafluoropentacene, 5,7,12,14-tetrafluoropentacene, and 6,13-difluoropentacene, and intermediates therefor are provided. And a method of producing fluorinated pentacene derivatives and intermediates therefor is also provided. Pentacene derivatives fluorinated at desired positions of the pentacene skeleton are obtained by introducing the oxo group, hydroxyl group, or alkoxyl group into the pentacene skeleton followed by fluorination with sulfur tetrafluoride and partial defluorination using a reducing agent.